WHAT IS CLAIMED IS:

1. A mass spectrometer comprising:

an ion source;

a 3D quadrupole ion trap for ejecting ions, after storing the ions generated by the ion source and stored for a certain period of time therein;

a Time-Of-Flight Mass Spectrometer (TOFMS) for accelerating the ions ejected from the ion trap in a direction orthogonal to the direction of their travel and measuring the time-of-flight of the accelerated ions;

and a mass filter, which is disposed between the ion source and the ion trap to control a first gas pressure inside the ion trap and a second gas pressure inside the mass filter independently.

2. A mass spectrometer according to claim 1, wherein the first gas pressure inside the ion trap is set to a level higher than the second gas pressure inside the mass filter.

3. A mass spectrometer according to claim 1, wherein the ions stored in the ion trap through the mass filter are dissociated in the ion trap and the mass of fragments resultant from ion dissociation are analyzed by the TOFMS.

4. A mass spectrometer according to claim 2, wherein the ions stored in the ion trap through the mass filter are dissociated in the ion trap and the mass of the fragments resultant from ion dissociation are analyzed by the TOFMS.

5. A mass spectrometer according to claim 1, wherein the mass filter is comprised of three-stage quadrupoles and has a controller for controlling gas pressure so that the gas pressure inside the second-stage quadrupole is lower than those inside the first-stage and the third-stage quadrupoles.

6. A mass spectrometer according to claim 2, wherein the mass filter is comprised of three-stage quadrupoles and has a controller for controlling gas pressure so that the gas pressure inside the second-stage quadrupole may be lower than those inside the first-stage and third-stage quadrupoles.

7. A mass spectrometer according to claim 1, wherein a peak, which has intervals between neighboring peaks on a mass spectrum exceeding a value pre-determined based on isolation resolution of the mass filter, is selected among peaks on the mass spectrum and an ion associated with the selected peak is isolated at the mass filter.

8. A mass spectrometer according to claim 7, wherein the

selected peak is displayed on a monitor screen.

9. A mass spectrometer according to claim 2, wherein a peak, which has intervals between neighboring peaks on a mass spectrum exceeding a value pre-determined based on isolation resolution of the mass filter, is selected among peaks on the mass spectrum and an ion associated with the selected peak is isolated at the ion trap.

10. A mass spectrometer according to claim 9, wherein the selected peak is displayed on a monitor screen.

11. A mass spectrometric method comprising:

generating sample ions at an ion source;

ejecting the ions after storing the ions generated in the ion source at a 3D quadrupole ion trap for a pre-set period of time;

analyzing the masses of the ions and/or fragments generated by ion dissociation using a Time-of-Flight Mass Spectrometer, wherein the Time-of-Flight Mass Spectrometer accelerates the ions ejected from the ion trap in the direction orthogonal to the direction of their travel; and

controlling the gas pressure inside the mass filter disposed between the ion source and controlling the gas pressure inside the ion trap, independently from eachother.

12. A mass spectrometric method according to claim 11, wherein first gas pressure inside the ion trap is set to a higher level than second gas pressure inside the mass filter in the controlling step.

13. A mass spectrometric method according to 11, further comprising:

dissociating the ions stored in the ion trap through the mass filter to produce fragment ions therein.

14. A mass spectrometric method according to claim 12, further comprising:

dissociating the ions stored in the ion trap through the mass filter to produce fragment ions therein.

15. A mass spectrometric method according to claim 11, wherein the mass filter is comprised of three-stage quadrupoles and has a step for controlling so that the gas pressure inside the second-stage quadrupole may be lower than those inside the first-stage and third-stage quadrupoles.

16. A mass spectrometric method according to claim 12, wherein the mass filter is comprised of three-stage quadrupoles and has a step for controlling so that the gas

pressure inside the second-stage quadrupole may be lower than those inside the first-stage and third-stage quadrupoles.

17. A mass spectrometric method according to 11, further comprising:

selecting a peak, which has intervals between neighboring peaks on a mass spectrum exceeding a value pre-determined based on an isolation resolution of the mass filter, among peaks on the mass spectrum;

isolating the ion associated with the selected peak in the ion trap.

18. A mass spectrometric method according to claim 17, wherein the selected peak is displayed on the screen.

19. A mass spectrometric method according to claim 12, further comprising:

selecting a peak, which has the intervals between neighboring peaks on a mass spectrum exceeding a value pre-determined based on the isolation resolution of the mass filter, among peaks on the mass spectrum; and

isolating the ion associated with the selected peak in the ion trap.

20. A mass spectrometric method according to claim 19, wherein the selected peak is displayed on the monitor screen.